

The economic value of ecosystem goods and services: The case of Mogale's Gate Biodiversity Centre, South Africa



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ABSTRACT

Natural capital provides various ecosystem goods and services essential to the survival of mankind. In most cases, however, the markets for natural capital are incomplete. As a result, ecosystem goods and services are being enjoyed “freely”. Here we assess the economic value of the ecosystem goods and services of Mogale's Gate Biodiversity Centre (MGBC) in South Africa using direct market values. We estimate the economic value of the natural capital stocks for game and carbon at approximately ZAR42 million (US\$3 million) for 2015. As for the flows of ecosystem goods and services, the economic value was estimated to be approximately ZAR23 million (US\$1.65 million) for 2015. Discounting these flow values into perpetuity and subtracting the discounted management cost yields the true economic value of the MGBC, which ranges between at least US\$15.5 and US\$41 million, depending on the discount rate used. This is between 25 and 67 times greater than the resource's published capital value. It is this gross underrepresentation of the true value of natural capital that often leads to its destruction. It is strongly recommended that MGBC be represented by its true value in the integrated report of its owner and that it be managed accordingly.

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1. Introduction

Natural capital is imperative to human life. It provides various goods and services, stocks and flows, which are essential to the survival of mankind. [Daly and Cobb \(1989\)](#) stress this by stating that natural capital is the non-produced means of producing a flow of natural resources and services. Natural capital can generally be classified into four sub-types, namely renewable natural capital (i.e. the ecosystem and flora and fauna contained therein), non-renewable natural capital (i.e. fossil fuels and other related geological minerals), replenishable natural capital (i.e. water resources and soils) and cultivated natural capital (i.e. agricultural crops, forestry plantations and fruit orchards) ([Aronson et al., 2007](#); [Crookes, 2012](#)). Natural capital is not only important for human life, but it also contributes to the economy's gross domestic product (GDP) and gross national product (GNP).

The economic value of ecosystem goods and services, however, is often poorly understood. In most cases only a few traded ecosystem goods and services are valued. The rest is seldom, if ever, valued in either financial or economic terms. In some instances these ecosystem goods and services have been enjoyed by mankind without acknowledgement of their existence due to ignorance and/or a lack of economic valuation. This negation in making the economic value explicit often gives rise to a techno-centric perspective whereby the resources are heavily exploited due to the free enjoyment thereof without any consideration of the impacts caused by this “cornucopian approach” to the current and future needs of mankind ([Crookes, 2012](#)). A rather naïve assumption adopted by such an approach is that the environment is highly resilient, even infinite (i.e. not scarce), in its capability to provide goods and services. Thus, the major focus has been on economic growth through the conversion of natural capital into productive (manufactured) goods. It has been noted in [Aronson et al. \(2006:1\)](#), by quoting Herman Daly, that the limiting supply to economic development is remaining natural capital, not manufactured capital, as it used to be, namely:

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More and more, the complementary factor in short supply is remaining natural capital, not manmade capital as it used to be. For example, populations of fish, not fishing boats, limit fish catch worldwide. Economic logic says to invest in the limiting factor. That logic has not changed, but the identity of the limiting factor has.

The simple yet profound truth can no longer be ignored. In the 21st century, natural capital is the limiting factor to economic development. It is therefore even more important than ever to make the value of ecosystem goods and services explicit. It should be emphasised that making such values explicit does not imply the commodification of nature. Rather the contrary. Such economic valuation exemplifies the importance of natural resources and stresses the need to conserve and restore such to enable its proper functioning into posterity. A mind-set change away from the techno-centric view of natural capital (Pearce and Turner, 1990) to a more anthropocentric (Turner et al., 2003) and eco-centric view (Purser et al., 1995) is therefore required to foster prudent management and justice on all levels (Blignaut, 2004; Blignaut et al., 2007). This will open up ways to ensure the optimisation of investments related to biodiversity conservation as mentioned in Kinzig et al. (2007).

This study estimates the economic value of a selection of ecosystem goods and services provided by the Mogale's Gate Biodiversity Centre (MGBC) using the direct market valuation approach. Only the ecosystem goods and services which are tradable on the market are considered in this study, since this research provides the foundation for the inclusion of these values in the integrated report and (in an ideal world) their eventual inclusion in the financial statements of the owners of Mogale's Gate – a large commercial bank. Although we are still some way off from the point where the value of ecosystem services are included in the

financial statements, it is expected that, by communicating the value of these goods and services to stakeholders through the integrated report, it is likely that more would be done to preserve this natural capital. Moreover, this practice could inspire the Bank's clients to adopt similar policies. This paper provides a brief description of the study site in Section 2. Next, the materials and methods are explained in Section 3, and the results are shown in Section 4. These results are then discussed and analysed in Section 5, and the study ends with recommendations and concluding remarks.

2. Study site

2.1. Site description

The Mogale's Gate Biodiversity Centre (MGBC) is located at approximately 20 km north-west of Mogale City (previously Krugersdorp) and 15 km east of Magaliesburg in the Gauteng province of South Africa (see Fig. 1) (Tuckett, 2013). Historically, the farm was operated as a cattle farm with some crop enterprises. However, when the property was acquired by the Bank in the mid-1980s, it was converted into a game reserve.

In terms of the geology, MGBC is characterised by the Vaalian Transvaal Sequence, Pretoria group, Timer Hill, Daspoort and the Stubenkop formations *inter alia* ferruginous quartzite and shale in conjunction with diabase. As for the pedological characteristics, MGBC consists of Hutton soils *inter alia* an orthic A horizon and a red apedal B horizon which is homogeneously coloured consisting of red and yellow oxides. This type of soil is rocky with loamy to clayey soil texture with a maximum depth of 60 cm, but other areas of the farm are much more shallow (Land Type Survey Staff, 2011 as cited in Tuckett, 2013).

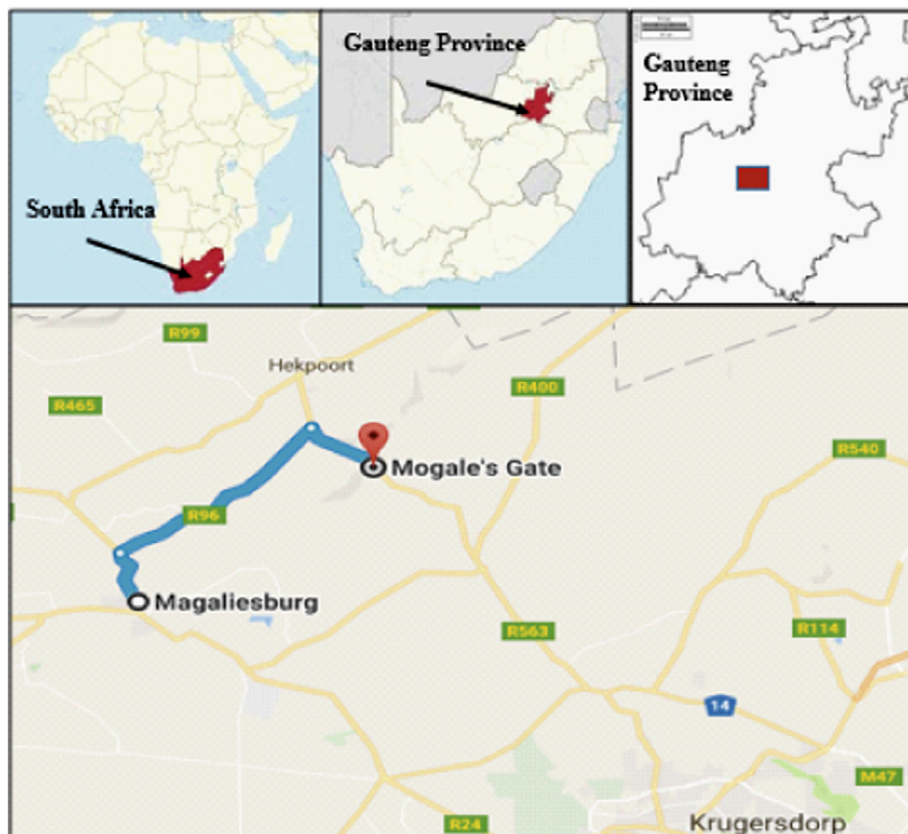


Fig. 1. Location of the Mogale's Gate Biodiversity Centre.

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